50537

# QUARTERLY UPDATE

## FOR SEPTEMBER 30, 1994 THROUGH DECEMBER 31, 1994

# HISTORICAL RELEASE REPORT (HRR)

**PREPARED BY**

**ENVIRONMENTAL RESTORATION**
**FACILITIES OPERATIONS MANAGEMENT**

**EG&G ROCKY FLATS, INC.**

**JANUARY 1995**

## HRR QUARTERLY UPDATE
## AGENCY ACCEPTANCE FORM

**HRR QUARTERLY UPDATE 10**

The recommendations of the Department of Energy (DOE) with regard to the need for future actions, or the lack of the need for future actions, are included in each PAC narrative description included in this quarterly update. Any PACs for which a decision is deferred will be addressed in future HRR quarterly updates.

Please note any exceptions to the recommended actions below or attach comments to this form as needed.

_____

_____

_____

_____.

Please provide comments or acceptance within two weeks from receipt of quarterly update submittal.

| DOE Signature | CDH Signature | EPA Signature |
|---|---|---|
| | ☐ CDH agrees with recommendations<br><br>☐ CDH disagrees with recommendations, see comments | ☐ EPA agrees with recommendations<br><br>☐ EPA disagrees with recommendations; see comments |
| DOE Concurrence | CDH Signature and Position | EPA Signature and Position |

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## 1.0 INTRODUCTION

This Tenth Quarterly Update to the Historical Release Report (HRR) provides a variety of information pertaining to spills, releases, or findings of contaminants at the Rocky Flats Environmental Technology Site (RFETS) Section I.B 3 of the Interagency Agreement (IAG) dated January 1991 states that the Department of Energy (DOE) shall amend the Historical Release Report every three months to include newly identified or suspected releases for which DOE has notified the Environmental Protection Agency (EPA) and Colorado Department of Public Health & Environment (CDPH&E). Spills, releases or findings which require reporting in this report are identified as Potential Areas of Concern (PACs). PAC writeups include Department of Energy, Rocky Flats Field Office (DOE,RFFO) recommendations for further action required or no further action required based upon all available process knowledge, analytical data, or formally conducted personal interviews. The Agency Acceptance Form on the second page of this report has been included in the past four quarterly reports to reach concurrence or non-concurrence on DOE RFFO recommendations from the regulatory agencies for action or no action acceptance.

Information for this quarterly report is structured as follows.

- HRR Quarterly Update Agency Acceptance Form;
- Listing of PACs identified since the June 1992 HRR per Section I B 3 of the Interagency Agreement (IAG) - Quarterly Notification (see Table 1);
- Listing of all PACs identified in the June 1992 HRR (see Table 2);
- Releases to the environment identified during October 1, 1994, through December 31, 1994,
- Revisions to PAC narratives;
- An up to-date Individual Hazardous Substance Site (IHSS) map; and
- An up-to-date Potential Area of Concern (PAC) map

Table 1 provides a list of all PACs identified since the June 1992 HRR. It also provides a cross-reference for the Operable Unit (OU) in which the incident occurred, IHSS numbers for spills occurring within an IHSS, a Resource Conservation and Recovery Act (RCRA) Contingency Plan Implementation Report (CPIR) cross-reference number and the number of the quarterly update in which the PAC was originally identified

Table 2 provides a listing of all PACs referenced in the June 1992 version of the Historical Release Report (HRR)

Revisions to PAC narratives are reserved for Section 3.0 of this document Section 3 0 is used to modify past narratives based on additional information which becomes available after the reporting process has begun Typically, additional information consists of validated analytical data from sampling or additional sample results from a later collection event.

Up-to-date copies of IHSS and PAC maps are included in Section 4 0. The IHSS map reflects the most current boundary location of IHSSs based on work to date at the various Operable Units. The PAC map includes all PACs identified to date, as well as Under Building Contamination (UBC) sites Up-to-date maps will continue to be issued with each quarterly report. These maps are made available to plant organizations requiring the most accurate and current information.

**TABLE 1**
**NEW PACS IDENTIFIED IN QUARTERLY UPDATES**

| IHSS[1] | OU[1] | CPIR Cross-Reference[2] | PAC | PAC NAME[3] | Original Quarterly Update # |
|---|---|---|---|---|---|
| 142 6 | 6 | NA | NE-1404 | Diesel Spill at Pond B-2 Spillway | 2 |
| NA | 2 | NA | NE-1405 | Diesel Fuel Spill at Field Treatability Unit *(formerly NE-1404)* | 3 |
| NA | 4 | NA | NE-1406 | 771 Hillside Sludge Release | 4 |
| NA | 2 | 93-002 | NE-1407 | OU 2 Treatment Facility | 4 |
| NA | 2 | 93-005 | NE-1408 | OU 2 Test Well *(formerly NE-1406)* | 4 |
| NA | 4 | 93-007 | NE-1409 | Modular Tanks and 910 Treatment System Spill *(formerly 000-503)* | 5 |
| NA | 2 | NA | NE-1410 | Diesel Fuel Spill at Field Treatability Unit | 7 |
| NA | 2 | NA | NE-1411 | Diesel Fuel Overflowed from Tanker at OU 2 Field Treatability Unit | 7 |
| NA | 2 | NA | NE-1412 | Trench T-12 Located in OU-2 East Trenches | 10 |
| NA | 2 | NA | NE-1413 | Trench T-13 Located in OU-2 East Trenches | 10 |
| | | | | | |
| NA | 10 | NA | NW-1500 | Diesel Spill at PU&D Yard *(formerly NW-175)* | 2 |
| NA | 10 | NA | NW-1501 | Asbestos Release at PU&D Yard *(formerly NW-176)* | 2 |
| 114 | 7 | 92-021 | NW-1502 | Improper Disposal of Diesel Contaminated Material at Landfill *(formerly NW-177)* | 2 |

**TABLE 1 (Continued)**
**NEW PACS IDENTIFIED IN QUARTERLY UPDATES**

| IHSS[1] | OU[1] | CPIR Cross-Reference[2] | PAC | PAC NAME[3] | Original Quarterly Update # |
|---|---|---|---|---|---|
| 114 | 7 | 92-004 | NW-1503 | Improper Disposal of Fuel Contaminated Material at Landfill | 1 |
| 114 | 7 | 94-002 | NW-1504 | Improper Disposal of Thorosilane Contaminated Material at Landfill | 7 |
| | | | | | |
| NA | 5 | NA | SW-1701 | Recently Identified Ash Pit | 9 |
| NA | 5 | NA | SW-1702 | Recently Identified Ash Pit | 9 |
| | | | | | |
| NA | NA | 94-005 | 000-503 | Solar Pond Water Spill Along Central Avenue | 7 |
| | | | | | |
| NA | NA | 93-003 | 100-613 | Asphalt Surface in Lay Down Yard North of Building 130 *(formerly identified as 000-501)* | 4 |
| | | | | | |
| NA | NA | 93-003 | 300-711 | Ni-Cad Battery Spill Outside of Building 373 | 1 |
| NA | NA | 92-002 | 300-712 | 1/2 gal Antifreeze Spilled by Street Sweeper Outside of Building 373 | 1 |
| NA | NA | 94-006 | 300-713 | Caustic Spill North of Building 331 | 8 |
| NA | NA | 94-012 | 300-714 | Laundry Waste Water Spill From Tank T-803, North of Building 374 | 10 |
| | | | | | |
| NA | NA | NA | 400-811 | Transformer 443-2, Bldg 443 | 2 |

**TABLE 1 (Continued)**
**NEW PACS IDENTIFIED IN QUARTERLY UPDATES**

| IHSS[1] | OU[1] | CPIR Cross-Reference[2] | PAC | PAC NAME[3] | Original Quarterly Update # |
|---|---|---|---|---|---|
| NA | NA | 93-009 | 400-812 | Tank T-2 Spill in Building 460 | 6 |
| NA | NA | 94-001 | 400-813 | RCRA Tank Leak in Building 460 | 7 |
| NA | NA | 94-007 | 400-814 | Air Conditioner Compressor Release, Building 444 Roof | 8 |
| NA | NA | 94-008 | 400-815 | RCRA Tank Leak in Building 460 | 8 |
| | | | | | |
| NA | NA | 93-004 | 500-906 | Asphalt Surface Near Building 559 | 4 |
| 172 | 13 | 94-009 | 500-907 | Tanker Truck Release of Hazardous Waste From Tank 231B | 9 |
| | | | | | |
| 52, 157.1, 172 | 12 | NA | 600-1004 | Central Avenue Ditch Cleaning Incident (formerly identified as 400-820) | 6 |
| NA | NA | NA | 600-1005 | Former Pesticide Storage Area | 7 |
| | | | | | |
| NA | NA | 92-005 | 800-1212 | Building 866 Sump Spill | 5 |
| | | | | | |
| NA | NA | NA | 900-1308 | Gasoline Spill Outside of Building 980 | 6 |
| NA | 2 | 93-010 | 900-1309 | OU 2 Field Treatability Unit Spill | 6 |
| NA | NA | 92-023 | 900-1310 | ITS Water Spill (formerly identified as 000-502) | 2 |

**TABLE 1 (Continued)**
**NEW PACS IDENTIFIED IN QUARTERLY UPDATES**

| IHSS[1] | OU[1] | CPIR Cross-Reference[2] | PAC | PAC NAME[3] | Original Quarterly Update # |
|---|---|---|---|---|---|
| NA | NA | NA | 900-1311 | Septic Tank East of Building 991 | 7 |
| NA | 2 | 94-004 | 900-1312 | OU-2 Water Spill | 7 |
| 192 | 16 | NA | 900-1313 | Seep Area Near OU-2 Influent | 9 |
| 101 | 4 | 94-010 | 900-1314 | Solar Evaporation Pond 207B Sludge Release | 9 |
| NA | NA | 94-013 | 900-1315 | Tanker Truck Release on East Patrol Road, North of Spruce Ave. | 10 |
| NA | NA | NA | 900-1316 | Elevated Chromium (total) Identified During Geotechnical Drilling | 10 |

[1]NA = Not applicable. Not all PACs are located in Individual Hazardous Substance Sites (IHSSs) or Operable Units (OUs). Likewise, not all PACs are identified in RCRA Contingency Plan Implementation Reports (CPIRs).

[2]RCRA Contingency Plan Implementation Reports (CPIRs) identified during the Eighth Quarter included CPIRs 94-006 through 94-008 Each incident involved a release to the environment and is therefore identified as a PAC.

[3]Several PAC numbers have been revised to reflect a more accurate location on the PAC map Former PAC numbers are identified in parentheses within italics.

## TABLE 2
## ORIGINAL POTENTIAL AREAS OF CONCERN
## SUBMITTED IN HISTORICAL RELEASE REPORT - JUNE 1992

| IHSS NO. | OU NO | PAC NO. | PAC NAME | PAGE |
|---|---|---|---|---|
| NORTHEAST BUFFER ZONE | | | | |
| NA[2] | NA | NE-1400 | Tear Gas Powder Release | NE-36 |
| NA | NA | NE-1401 | NE Buffer Zone Gas Line Break | NE-37 |
| NA | NA | NE-1402 | East Inner Gate PCB Spill | NE-38 |
| NA | NA | NE-1403 | Gasoline Spill - Building 920 Guard Post | NE-39 |
| NORTHWEST BUFFER ZONE | | | | |
| NA | NA | SE-1600 | Pond 7 - Steam Condensate Releases | SE-10 |
| NA | NA | SE-1601 | Pond 8 - Cooling Tower Discharge Releases | SE-13 |
| SOUTHWEST BUFFER ZONE | | | | |
| NA | NA | SW-1700 | Fuel Spill into Woman Creek Drainage | SW-15 |
| 000 AREA | | | | |
| NA | NA | 000-500 | Sanitary Sewer System | 000-49 |
| NA | NA | 000-501 | Roadway Spraying | 000-60 |
| 100 AREA | | | | |
| NA | NA | 100-600 | Mercury Spill - Valve Vault 124-B, Building 124 | 100-8 |
| NA | NA | 100-601 | Building 123 Phosphoric Acid Spill | 100-10 |
| NA | NA | 100-602 | Building 123 Process Waste Line Break | 100-11 |
| NA | NA | 100-603 | Building 123 Bioassay Waste Spill | 100-13 |
| NA | NA | 100-604 | T130 Complex Sewer Line Leaks | 100-15 |
| NA | NA | 100-605 | Building 115 Hydraulic Oil Spill | 100-16 |
| NA | NA | 100-606 | Building 125 TCE Spill | 100-17 |
| NA | NA | 100-607 | Building 111 Transformer PCB Leak | 100-18 |
| NA | NA | 100-608 | Building 131 Transformer Leak | 100-20 |
| NA | NA | 100-609 | Building 121 Security Incinerator | 100-21 |
| NA | NA | 100-610 | Asbestos Release - Building 123 | 100-22 |
| NA | NA | 100-611 | Building 123 Scrubber Solution Spill | 100-23 |
| NA | NA | 100-612 | Battery Solution Spill - Building 119 | 100-25 |
| 300 AREA | | | | |
| NA | NA | 300-700 | Scrap Roofing Disposal | 300-25 |

**TABLE 2 (continued)**

| IHSS NO | OU NO | PAC NO | PAC NAME | PAGE |
|---|---|---|---|---|
| NA | NA | 300-701 | Sulfuric Acid Spill - Building 371 | 300-26 |
| NA | NA | 300-702 | Pesticide Shed | 300-27 |
| NA | NA | 300-703 | Building 331 North Area | 300-28 |
| NA | NA | 300-704 | Roof Fire, Building 381 | 300-29 |
| NA | NA | 300-705 | Potassium Hydroxide Spill North of Building 374 | 300-30 |
| NA | NA | 300-706 | Evaporator Tanks North of Building 374 | 300-31 |
| NA | NA | 300-707 | Sanitizer Spill | 300-33 |
| NA | NA | 300-708 | Transformers North of Building 371 | 300-34 |
| NA | NA | 300-709 | Transformer Leak 334-1 | 300-35 |
| NA | NA | 300-710 | Gasoline Spill North of Building 331 | 300-36 |
| 400 AREA | | | | |
| NA | NA | 400-800 | Transformer 443-1 | 400-40 |
| NA | NA | 400-801 | Transformer, Roof of Building 447 | 400-41 |
| NA | NA | 400-802 | Storage Area, South of Building 334 | 400-42 |
| NA | NA | 400-803 | Miscellaneous Dumping, Building 460 Storm Drain | 400-44 |
| NA | NA | 400-804 | Road North of Building 460 | 400-45 |
| NA | NA | 400-805 | Building 443 Tank #9 Leak | 400-46 |
| NA | NA | 400-806 | Catalyst Spill, Building 440 | 400-47 |
| NA | NA | 400-807 | Sandblasting Area | 400-48 |
| NA | NA | 400-808 | Vacuum Pump Leak - Building 442 | 400-49 |
| NA | NA | 400-809 | Oil Leak - 446 Guard Post | 400-51 |
| NA | NA | 400-810 | Beryllium Fire - Building 444 | 400-52 |
| 500 AREA | | | | |
| NA | NA | 500-900 | Transformer Leak - 515/516 | 500-15 |
| NA | NA | 500-901 | Transformer Leak - 555 | 500-17 |
| NA | NA | 500-902 | Transformer Leak - 559 | 500-18 |
| NA | NA | 500-903 | RCRA Storage Unit #1 | 500-19 |
| NA | NA | 500-904 | Transformer Leak - 223-1/223-2 | 500-20 |
| NA | NA | 500-905 | Transformer Leak - 558-1 | 500-22 |

**TABLE 2 (continued)**

| IHSS N0 | OU NO. | PAC NO | PAC NAME | PAGE |
|---|---|---|---|---|
| 600 AREA | | | | |
| NA | NA | 600-1000 | Transformer Storage Building 662 | 600-18 |
| NA | NA | 600-1001 | Temporary Waste Storage Building 663 | 600-20 |
| NA | NA | 600-1002 | Transformer Storage - West of Building 666 | 600-24 |
| NA | NA | 600-1003 | Transformers North and South of 661-675 Substation | 600-25 |
| 700 AREA | | | | |
| NA | NA | 700-1100 | French Drain North of Building 776/777 | 700-76 |
| NA | NA | 700-1101 | Laundry Tank Overflow - Building 732 | 700-77 |
| NA | NA | 700-1102 | Transformer Leak - 776-4 | 700-78 |
| NA | NA | 700-1103 | Leaking Transformers - Building 707 | 700-80 |
| NA | NA | 700-1104 | Leaking Transformers - Building 708 | 700-82 |
| NA | NA | 700-1105 | Transformer Leak - 779-1/779-2 | 700-83 |
| NA | NA | 700-1106 | Process Waste Spill - Portal 1 | 700-84 |
| NA | NA | 700-1107 | Compressor Waste Oil Spill - Building 776 | 700-86 |
| NA | NA | 700-1108 | 771/774 Footing Drain Pond | 700-87 |
| NA | NA | 700-1109 | Uranium Incident - Building 778 | 700-90 |
| NA | NA | 700-1110 | Nickel Carbonyl Burial West of Building 771 | 700-91 |
| NA | NA | 700-1111 | Leaking Transformer - Building 750 | 700-92 |
| NA | NA | 700-1112 | Leaking Transformer - 776-5 | 700-93 |
| 800 AREA | | | | |
| NA | NA | 800-1200 | Valve Vault 2 | 800-28 |
| NA | NA | 800-1201 | Radioactive Site South of Building 883 | 800-30 |
| NA | NA | 800-1202 | Sulfuric Acid Spill, Building 883 | 800-31 |
| NA | NA | 800-1203 | Sanitary Sewer Line Break Between Buildings 865 and 886 | 800-32 |
| NA | NA | 800-1204 | Building 866 Spills | 800-33 |
| NA | NA | 800-1205 | Building 881, East Dock | 800-35 |
| NA | NA | 800-1206 | Fire, Building 883 | 800-36 |
| NA | NA | 800-1207 | Transformer 883-4 | 800-37 |

**TABLE 2 (continued)**

| IHSS NO | OU NO | PAC NO | PAC NAME | PAGE |
|---|---|---|---|---|
| NA | NA | 800-1208 | Transformer 881-4 | 800-38 |
| NA | NA | 800-1209 | Leaking Transformers, 800 Area | 800-39 |
| NA | NA | 800-1210 | Transformer 865-1 and 865-2 | 800-40 |
| NA | NA | 800-1211 | Capacitor Leak, Building 883 | 800-41 |
| 900 AREA | | | | |
| NA | NA | 900-1300 | RO Plant Sludge Drying Beds | 900-47 |
| NA | NA | 900-1301 | Building 991 Enclosed Area | 900-48 |
| NA | NA | 900-1302 | Gasoline Spill | 900-50 |
| NA | NA | 900-1303 | Natural Gas Leak | 900-51 |
| NA | NA | 900-1304 | Chromic Acid Spill - Building 991 | 900-52 |
| NA | NA | 900-1305 | Building 991 Roof | 900-53 |
| NA | NA | 900-1306 | Transformers 991-1 and 991-2 | 900-54 |
| NA | NA | 900-1307 | Explosive Bonding Pit | 900-55 |

# SECTION 2.0

# NEW PAC NARRATIVES

# (PACS IDENTIFIED BETWEEN SEPTEMBER 30, 1994, AND DECEMBER 31, 1994)

**PAC REFERENCE NUMBER: 300-714**

IHSS Number: NA

Unit Name: Laundry Waste Water Spill From Tank T-803, North of Building 374

CPIR No.: 94-012

Approx. Location: N750,500; E2,082,500

Date(s) of Operation or Occurrence

November 17, 1994

Description of Operation or Occurrence

On November 17, 1994 while performing restart operations of the 374 evaporator system a release of a hazardous waste was reported from Tank T-803 when the level indicating controller failed allowing liquids to accumulate until the pressure disk ruptured (as designed). The evaporator system had been shut down to perform maintenance on another tank connected in-series (acid tank D-845). The release occurred from the second effect vapor body (Tank-T-803) of the quadruple effect steam heated evaporator system located north of Building 374. Approximately 50 gallons of evaporator process aqueous waste (i.e. laundry waste water) was released to the secondary containment berm and approximately 5 gallons was sprayed to the dirt road immediately north of the bermed area. The wetted area on the road was estimated to be approximately ten feet by twelve feet, however, the majority of the liquid was observed within a four square foot area.

Physical/Chemical Description of Constituents Released

The material released was a mixture of the current evaporator process aqueous waste feed and previous waste feeds which have been determined to be an F-listed hazardous waste. The EPA waste codes assigned to the waste treated in the evaporator system include: D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, F003, F005, F006, F007, F009, and F039 This characterization is based on the constituents that can be present in the waste streams to the evaporator system as well as characterization of the remaining brine solutions when the process is complete.

Validated analytical results from soil sampling conducted on November 18, 1994 are presented in Tables 1 and 2 of the following page

**TABLE 1**
**SAMPLE RESULTS - METALS BY ICPES**

| Analyte | Total Metals In Released Liquid | * | TCLP Leachate from Soil Remaining | * | TCLP Leacnate from Soil Adjacent | * | Toxicity Characteristic Regulatory Level |
|---|---|---|---|---|---|---|---|
| Arsenic | 0.081 | U | 0.081 | U | 0.081 | U | 5.0 |
| Barium | 0 023 | B | 0.450 | U | 0.426 | U | 100.0 |
| Cadmium | 0.030 | | 0.006 | | 0.006 | | 1.0 |
| Chromium | 0 031 | | 0 005 | U | 0.005 | U | 5.0 |
| Lead | 0 038 | U | 0.039 | B | 0 045 | B | 5 0 |
| Selenium | 0 040 | U | 0.040 | U | 0 040 | U | 1.0 |
| Silver | 0.011 | | 0.003 | U | 0 003 | U | 5 0 |

Results are in mg/L.

U = The analyze concentration (before dilution factors were applied) was below the Instrument Detection Limit (IDL). The number in the table preceding "U" is the IDL for this sample aliquot.

B = The absolute value of the analyzed result (before dilution factors were applied) is above the IDL but is less than the Contract Required Detection Limit (CRDL).

## TABLE 2
## SAMPLE RESULTS - TAL VOLATILE ORGANICS BY GC/MS

| Analyte | Released Liquid | | Soil Remaining | | Soil Adjacent | | Toxicity Characteristic Regulatory Level |
|---|---|---|---|---|---|---|---|
| Chloromethane | 0.010 | U | 0.010 | U | 0.010 | U | N/A |
| Bromomethane | 0.010 | U | 0.010 | U | 0.010 | U | N/A |
| Vinyl Chloride | 0.010 | U | 0.010 | U | 0.010 | U | 0.2 |
| Chloroethane | 0.010 | U | 0.010 | U | 0.010 | U | N/A |
| Methylene Chloride | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| Acetone | 0.110 | B | 0.010 | U | 0.010 | U | N/A |
| Carbon Disulfide | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| 1,1-Dichloroethylene | 0.005 | U | 0.005 | U | 0.005 | U | 0.7 |
| 1,1-Dichloroethane | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| 1,2-Dichloroethane (total) | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| Chloroform | 0.005 | U | 0.005 | U | 0.005 | U | 6.0 |
| 1,2-Dichloroethane | 0.005 | U | 0.005 | U | 0.005 | U | 0.5 |
| Methyl Ethyl Ketone | 0.048 | U | 0.010 | U | 0.010 | U | 200.0 |
| 1,1,1-Trichloroethane | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| Carbon Tetrachloride | 0.005 | U | 0.005 | U | 0.005 | U | 0.5 |
| Bromodichloromethane | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| 1,2-Dichloropropane | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| cis-1,3-Dichloropropene | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| Trichloroethylene | 0.005 | U | 0.005 | U | 0.005 | U | 0.5 |
| Dibromochloromethane | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| 1,1,2-Trichloroethane | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| Benzene | 0.003 | J | 0.005 | U | 0.005 | U | 0.5 |
| trans-1,3-Dichloropropene | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| Bromoform | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| Methyl Isobutyl Ketone | 0.010 | U | 0.010 | U | 0.005 | U | N/A |
| 2-Hexanone | 0.010 | U | 0.010 | U | 0.010 | U | N/A |
| Tetrachloroethylene | 0.005 | U | 0.005 | U | 0.005 | U | 0.7 |
| 1,1,2,2-Tetrachloroethane | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| Toluene | 0.005 | U | 0.005 | U | 0.002 | J | N/A |
| Chlorobenzene | 0.005 | U | 0.005 | U | 0.005 | U | 100.0 |
| Ethylbenzene | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| Styrene | 0.005 | U | 0.005 | U | 0.005 | U | N/A |
| Xylene (Total) | 0.005 | U | 0.005 | U | 0.005 | U | N/A |

Results are in mg/L.

U = Compound not found. The number in the table preceding the "U" is the Practical Quantitation Limit (PQL) for this sample aliquot.

B = Compound found, but is also present in the daily method blank.

J = Compound found, but quantity is below PQL. Quantitation is estimated.

Response to Operation or Occurrence

The evaporator system was immediately shut down and actions were taken on November 17, 1994 to remove the liquid and contaminated soil Approximately 80 to 90 pounds of soil was removed and managed as low level mixed hazardous waste in RCRA Unit No. 374-380 in Building 374. On November 18, 1994, two sets of composite soil samples were collected in accordance with the RCRA Permit, Section VI(D)(4)(b)-Sampling. One set of samples were collected from the soil remaining after the wetted soil area had been removed. Another set of samples were collected adjacent to the wetted area, along the west side, to determine if pre-existing contamination was present from past releases in this area. This area has been previously identified as a Potential Area of Concern (PAC 300-706) in the June 1992 Historical Release Report (HRR) for the Rocky Flats Environmental Technology Site (RFETS). The evaporator system was repaired and placed back into service on November 19, 1994.

Fate of Constituents Released to Environment

Due to the weather conditions at the time of the incident, the surface of the soil was frozen and the likelihood of vertical or lateral contaminant migration was minimal. A significant attempt was noted to remove the wetted soil using shovels and a rock bar to loosen the frozen soil Analytical results from samples collected on November 18, 1994 (Table 1 and 2) show that both remaining soils from the cleanup area and adjacent area are below or equal to the analytical detection limits

Action/No-Action Recommendation

For the above mentioned reasons, no further investigation is warranted for this release

Comments

None.

**PAC REFERENCE NUMBER:** 900-1315

IHSS Number: NA

Unit Name: Tanker Truck Release on East Patrol Road, North of Spruce Ave.

CPIR No.: 94-013

Approx. Location: N750,500; E2,082,500

Date(s) of Operation or Occurrence

December 13, 1994

Description of Operation or Occurrence

At Approximately 11:40 a m., December 13, 1994 during transport operations of Solar Evaporation Pond decant waste water, approximately 10 gallons of hazardous waste was released to the environment. A tanker truck was transporting the decant water from the 750 Storage Pad (RCRA Unit 25) where Solar Evaporation Pond sludges are separated through a settling process to Building 374 feed storage tanks (Tank 231 A and B) for subsequent treatment at Building 374. The truck driver immediately stopped when he noticed that liquid was splashing from the vent/blowdown valve which was inadvertently left open during the filling process. It was estimated that approximately 10 gallons of hazardous waste was released to the asphalt and soil The released liquid contacted two sections of asphalt road surface and one section of soil (approximately 1 ft. by 100 ft in dimension) The release to asphalt was north of Spruce Avenue on the East Patrol Road. Soil was contaminated in an area just northeast of Building 964. Soil samples were collected on December 13, 1994.

Physical/Chemical Description of Constituents Released

The material released from the tanker was Solar Evaporation Pond decant water which originated from the 207-A and 207-B Ponds. The most common characteristic of the waste released to the solar ponds is high concentrations of nitrate. Historical records document that the ponds frequently received untreated process waste as well as treated process waste and contaminated scrap metals EPA waste codes assigned to the sludge and decant water are determined from backlog recharacterization records and include F001, F002, F003, F005, F006, F007, F009 and F039

Response to Operation or Occurrence

Upon discovery of the release, Radiological Protection immediately responded and performed surveys in accordance with plant procedures concerning response to a release of mixed waste. The vent/blow down valve was closed to prevent further release of the decant water and decontamination procedures began immediately to remediate the spilled liquid both on the tanker and asphalt surfaces. A triple rinse was performed on the asphalt surfaces using a detergent solution followed by Wet-Vac vacuum procedures. The decant liquid spilled on the soil was excavated to a depth of 2 inches (until no evidence of wetted soil could be seen) and containerized in wooden crates. Approximately 4560 pounds of soil were removed and managed as RCRA regulated hazardous waste at RCRA Unit 25 (750 Pad). Two surficial soil samples were collected from the area on December 13, 1994. One composite sample was collected after the wetted soil was containerized to verify that adequate cleanup was performed and another was collected adjacent to the spill area to determine if any pre-existing contamination was present due to the close proximity of IHSS 900-165. In addition, samples of decant water were collected from the tanker. The preliminary sweep analysis for select metals and volatile organics indicate that levels of toxic constituents are well below Toxicity Characteristic Leaching Procedure (TCLP) regulatory limits. Validated analytical results are unavailable at the time.

Fate of Constituents Released to Environment

Due to the condition of the soil (i e. hard packed) and the prompt removal of liquid and wetted soil, hazards to human health or the environment were mitigated. Analytical results from samples collected on December 13, 1994 are pending the validation process; however preliminary data strongly indicate that both releases to asphalt and soil were adequately cleaned up.

Action/No-Action Recommendation

Based upon cleanup documentation, preliminary analytical data and radiological surveys of the area, this site should not require further action. **If the final analytical data does not confirm that the soil contaminated as a result of this incident was adequately removed, a soil response plan will be submitted to the Colorado Department of Public Health & the Environment (CDPH&E).**

Comments

None

**PAC REFERENCE NUMBER:** 900-1316

IHSS Number. NA

Unit Name: Elevated Chromium (total) Identified During Geotechnical Drilling

CPIR No.: NA

Approx Location: N750,000; E2,086,000

Date(s) of Operation or Occurrence

August 24, 1994

Description of Operation or Occurrence

On August 24, 1994 while conducting geotechnical drilling prior to construction for a storage facility (Investigative Derived Material Storage Facility) at the Field Operations Yard located south and west of the 904 Pad, chromium (total) was detected in the drummed cuttings at levels above allowable RCRA limits (106 ppm and 120 ppm). Additional sampling was conducted on September 28, 1994 from 6 study pits excavated to a depth of 6 feet along the eastern perimeter of the proposed building foundation to provide additional information Analytical data received October 5, 1994 show chromium levels below or at background. On October 19, 1994 one additional borehole was drilled approximately 18 feet northwest of the southwest corner of the proposed building. Analytical data received October 26, 1994 conclude that chromium (total) was detected at 138 ppm and 347 ppm from two depth integrated composite sample intervals taken between 6 and 8 feet and 10½ and 14 feet respectively. Volatile organics were not detected in any of the sampling events.

The initial construction phase which included excavation to a depth of 6 feet for the building foundation wall was put on hold pending a Risk Assessment Screen (RAS) using all available data The risk assessment was completed on January 17, 1995. Analytical data is included in Tables 1, 2, and 3 of the RAS (supplementary attachment for this PAC write-up).

Interviews with plant employees familiar with past uses of the Field Operations Yard were conducted on January 18, and January 27, 1995

Physical/Chemical Description of Constituents Released

Historically, the Field Operations Yard (formerly called the contractors yard) was used to store miscellaneous equipment, discard scrap metal, stockpile gravel for construction use, and deposit spoils from excavation projects. One employee stated that from approximately 1971 to 1980, chromium shavings from a chrome plating lab located in Building 444 and a plating/testing lab in Building 779 were frequently swept using an industrial sweeper truck. The sweepings were

emptied from the sweeper in the contractors yard The employees recollection of this practice was collaborated with two other employees.

Response to Operation or Occurrence

Upon receipt of the original data set on August 24, 1994 further investigation was initiated to identify the potential source of the chromium anomaly. Six test pits were excavated on September 28, 1994, three additional boreholes have been drilled, plant employees have been interviewed to gather historical knowledge of past uses for the area, and samples have been collected to provide supporting background information. Analytical results from sampling events were used to develop a Risk Assessment Screen completed on January 17, 1995.

The scheduled construction phase which involves excavation to a depth of approximately 6 feet remains on hold at the time of this write-up.

Fate of Constituents Released to Environment

Toxicity Characteristic Leaching Process (TCLP) analysis for metals collected from the area of the highest chromium concentration (347 ppm at 10½ - 14 ft) show that soils from the chromium anomaly do not readily leach and the anomaly does not pose an unreasonable risk to groundwater (estimated to be at 26 feet), human health, or the environment (see attached Risk Assessment Screen)

Action/No-Action Recommendation

Based upon calculated risk results from the comprehensive Risk Assessment Screen (RAS) completed January 17, 1995 and TCLP analytical data showing the chromium does not readily leach, this finding does not warrant further action

Comments

None

# RISK ASSESSMENT SCREEN (RAS) FOR INVESTIGATIVELY-DERIVED MATERIAL (IDM) STORAGE BUILDING CONSTRUCTION SITE

A risk assessment screen (RAS), including the Colorado Department of Public Health and Environment (CDPHE) conservative screen and a more comprehensive RAS, have been performed on data collected from soils located at the proposed construction site of the IDM Storage Building A conservative approach was used to ensure that any actual health hazards would fall well within the bounds of the calculated risks (carcinogenic) and hazard quotients (noncarcinogenic) The screening methodology used for this RAS are appropriate for a screening level analysis only and are not those applied to baseline risk assessments in the environmental restoration program due to the fact that subsurface soils are not assessed for residential use Exposure factors may also be more conservative

## DATA

The data that is usable for quantitative risk assessment purposes are presented in Tables 1 and 2 These represent the results of the Inductively Coupled Plasma Emission Spectrometry (ICP) analysis for total metals The first three samples are from geotechnical borings taken at corners of the proposed building Screening level analysis had indicated that chromium-total (Cr-tot) was present at levels that might be above background in the subsurface soil ICP analysis confirmed the presence of Cr-tot above the background UTL of 89 2 mg/kg (1993 Background Geochemistry Characterization Report, DOE, Sept 30, 1993) in two of the samples No other analytes were above background UTLs

As a result, a second boring was made, within the perimeter, near the SE corner of the proposed building Samples were retrieved by depth In general, the concentrations were low The samples taken from 6-8 feet and 10 5-14 feet were above the Cr-tot background UTL, with a maximum of 347 mg/kg in the sample from 10 5-14 feet All other samples were well below the UTL (Table 1) No other analytes were above the UTLs

A series of six surface pits, six feet deep, were dug and sampled with depth Results are shown in Table 2 No analytes, were above background UTLs Cr-tot levels were all low

## CDPHE CONSERVATIVE SCREEN

The only chemical identified as above the background UTL was chromium This was the only chemical included in the screen The CDPHE screen specifies that the ratio of the maximum detected concentration of a chemical in a medium to the risk-based concentration (PPRG) be calculated and then the ratios summed for all chemicals of concern in a media In this case there is only one chemical, Cr-tot Chromium was determined as total chromium in the

samples therefore we can not be sure whether the CR is present as CR-III, a noncarcinogenic form, or as CR-VI, a carcinogenic form Other sampling events at RFETS have found only CR-III However, to be conservative the screen will be performed using both forms of CR

Cr-III

$$\frac{347 \text{ mg/kg}}{274000 \text{ mg/kg}} = 0\ 001$$

Cr-VI

$$\frac{347 \text{ mg/kg}}{939 \text{ mg/kg}} = 0\ 37$$

The trivalent form, CR-III, has a very low screen result of 0 001, the hexavalent form, Cr-VI, has a ratio to the risk-based PPRG of 0 37 still well below 1 0 Sources with a ratio of less than one are considered candidates for no further action by the CDPHE conservative screen methodology, pending evaluation of possible dermal effects Chromium in combination with soil as present at the site is not considered a potential dermal hazard

In summary, the CDPHE screen ratio falls between 0 001 and 0 37, depending on the Cr form present Based on other RFETS data, it is likely that the Cr-III form predominates and it is likely that the ratio is closer to 0 001 than to 0 37 The site is a good candidate for no further action

## RISK ASSESSMENT METHODS

A very conservative approach was used for this RAS The exposure concentration chosen for Cr-tot is the maximum detected concentration (347 mg/kg) This represents a worst-case, maximum exposure Actual exposures would be much less due to the large volume of soil known to have lower concentrations of Cr-tot The analysis did not specify whether the chromium detected was Cr-VI or Cr-III

Toxicologically there is a significant difference between the two Cr-VI is a known human carcinogen, whereas, Cr-III is not thought to be carcinogenic Other investigations at the Rocky Flats Environmental Technology Site (RFETS) done in support of Remedial Investigations (RI) have not found CR-VI to be present. It is unlikely that it is present at this building site
The RAS was performed for both species of Cr Thus, the RAS presents the full range of risk and health hazard that may be associated with the site under the chosen exposure scenarios, although those resulting from Cr-VI are unlikely

Two exposure scenarios were chosen for the RAS A hypothetical resident with child and a construction worker The former represents a potential upper bound risk The latter represents a realistic exposure, based on the proposed land use

## Hypothetical Resident

Standard EPA default assumptions were used for the scenario
The intake or dose was calculated by the following equation

Intake = Cr concentration * intake rate * exposure frequency * exposure duration
body weight * averaging time

Where

| | | |
|---|---|---|
| Cr concentration | = | 347 mg/kg |
| intake rate-ingestion | = | 100 mg/day-adult, 200 mg/day-child |
| intake rate-inhalation | = | 20 $m^3$/day |
| exposure frequency | = | 350 days/year |
| exposure duration | = | 30 years-adult, 6 years-child |
| body weight | = | 70 kg-adult, 15 kg-child |
| averaging time | = | 70 years-carcinogenic, equal to exposure duration-noncarcinogenic |

Although the Cr-tot detections were between 6 and 14 feet below present ground level, it is assumed that this soil could be distributed on the surface during home construction It is also assumed that the adult resident lives on the land in question for 30 years The childhood period is set at six years For calculating the hypothetical carcinogenic effects of exposure to CrVI due to inhalation of fugitive dust an EPA default particle emissions factor (PEF) of 8 63 x $10^9$ was used in the numerator of the equation For carcinogens the averaging time is equal to a lifetime, estimated at 70 years The averaging time for noncarcinogens is equal to the exposure duration in order to compare an estimate of actual daily intake to a reference dose (RfD) considered safe for a life time exposure

## Construction Worker

The equation for calculating intakes for this scenario is equivalent to that for the hypothetical resident, including the PEF The values of some of the parameters a different Only those that differ are given below

| | | |
|---|---|---|
| intake rate-ingestion | = | 480 mg/day |
| intake rate-inhalation | = | 10 $m^3$/day |
| exposure frequency | = | 30 days/year |
| exposure duration | = | 1 year |
| body weight | = | 70 kg |
| averaging time | = | 70 years-carcinogenic, equal to exposure duration-noncarcinogenic |

This is a realistic scenario It assumes the worker to be exposed to the soil for a period of 30 days during the construction process

## Risk and Hazard Quantification

To calculate carcinogenic risk the intake is then multiplied by a chemical specific slope factor (SF) Carcinogenic risk is calculated as the incremental probability of an individual developing cancer over a lifetime, due to a given exposure scenario This is also referred to as the excess lifetime cancer risk and represents the increased risk of developing cancer above the background rate (about 25 to 30%)

The potential for noncarcinogenic health effects is not expressed as a probability, but as a ratio or quotient The hazard quotient (HQ) is the ratio of the daily intake over a specified period (exposure duration) to the chemical specific RfD If the HQ exceeds 1 0 there is concern that the exposed population may experience adverse health effects due to the specified exposure scenario

## Results and Discussion

The carcinogenic risk for a hypothetical resident from inhalation of dust, assuming that all of the Cr-tot detected is Cr-VI, and that the individual is exposed to the maximum detected concentration (347 mg/kg soil) for 350 days a year for 30 years, is $4 \times 10^{7}$ (Table 3) This is below the reasonable level of concern, usually stated as $1 \times 10^{6}$ As stated previously, there is no known carcinogenic hazard due to exposure to Cr-III

The hypothetical residential exposure levels should not be expected to produce negative health effects in either adults or children, whether the Cr-tot is assumed to be present as CrVI, which is improbable and not supported by other data collected at RFETS, or as Cr-III All HQ are below 1 0

Risks and HQ for the construction worker scenario are even lower due to the shorter exposure period Individuals working on building construction should experience no adverse health effects, even if the Cr-tot detected is CrVI and they are exposed to the maximum detected concentration (347 mg/kg soil) for 30 days during the construction process

## Summary

Based on the results of the RAS, there is no reason to believe that even maximally exposed individuals would suffer negative health effects due to exposure to subsurface soil at the proposed IDM Storage Building site This is supported by the very low risk-based ratios calculated in the CDPHE conservative screen Proposed excavations at the site for foundation work are planned not to exceed a depth of five to six feet All elevated Cr-tot detections were below this depth (Tables 1 and 2) Therefore, it may be expected that workers will be exposed to much lower levels of Cr-tot than used for the calculations in the RAS

# Table 1 : Subsurface Samples

| Analyte | Sample | Sample | Sample | Borehole | Borehole | Borehole | Borehole | Borehole | Borehole | Borehole |
|---|---|---|---|---|---|---|---|---|---|---|
| | NE Corner | SW Corner | SE Corner | 6 8 ft | 10 10 5 ft | 10 5-14 ft | 14-15 ft | 16 17 ft | 18 18 4 ft | 20-22 ft |
| | 94E1220 3 | 94E1220 11 | 94E1220-15 | 95E0072 3 | 95E0072 5 | 95E0072-7 | 95E0072 9 | 95E0072-11 | 95E0072-13 | 95E0072-15 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| Aluminum | 15300 | 1400 | 12600 | 8510 | 7690 | 8460 | 9700 | 11200 | 8210 | 3940 |
| Antimony | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Arsenic | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Barium | 96 3 | 62 3 | 164 | 108 | 107 | 131 | 168 | 109 | 77 | 51 4 |
| Beryllium | 0 71 | 0 66 | 0 70 | 0 62 | 0 62 | 0 53 | 0 75 | 0 67 | 0 55 | 0 45 |
| Cadmium | 0 75 | 0 60 | 0 57 | ND | 0 40 | 0 36 | 0 43 | 0 44 | 0 44 | 0 54 |
| Calcium | 11200 | 17500 | 7640 | 15700 | 8520 | 7470 | 3940 | 5630 | 2920 | 2540 |
| Chromium | 106 | 73 6 | 120 | 138 | 38 4 | 347 | 15 4 | 16 1 | 39 3 | 4 8 |
| Cobalt | 6 9 | 4 7 | 9 1 | 7 7 | 5 7 | 14 0 | 15 3 | 9 9 | 8 9 | 3 7 |
| Copper | 12 6 | 11 2 | 17 3 | 12 8 | 11 1 | 17 7 | 19 8 | 16 8 | 12 3 | 11 6 |
| Iron | 13200 | 13000 | 14700 | 11600 | 9380 | 16300 | 15300 | 15200 | 10500 | 9710 |
| Lead | 6 6 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Magnesium | 2400 0 | 2530 | 1880 | 1800 | 1660 | 1610 | 2280 | 2350 | 1600 | 927 |
| Manganese | 375 | 182 | 868 | 623 | 539 | 736 | 992 | 565 | 400 | 139 |
| Nickle | 25 8 | 16 2 | 27 3 | 26 5 | 19 9 | 21 1 | 24 3 | 18 | 13 5 | 7 1 |
| Potassium | 2180 | 2060 | 2000 | 1150 | 1020 | 1070 | 1260 | 1260 | 1190 | 610 |
| Selenium | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Silver | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sodium | 1840 | 145 | 148 | 90 6 | 79 7 | 92 7 | 69 5 | 178 | 73 | 51 5 |
| Thalium | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vanadium | 27 8 | 26 4 | 30 8 | 24 2 | 21 6 | 24 1 | 42 5 | 41 5 | 21 7 | 28 9 |
| Zinc | 21 6 | 19 8 | 18 9 | 15 1 | 15 5 | 15 9 | 21 3 | 22 | 19 3 | 35 3 |

# Table 2: Surface Samples

| Analyte | Sample | Sample | Sample | Sample | Sample | Sample |
|---|---|---|---|---|---|---|
| | NE Pit--2 ft | NE Pit--4 ft | NE Pit--6 ft | SE Pit--2 ft | SE Pit--4 ft | SE Pit--6 ft |
| | 94E1420-0004 | 94E1420-0005 | 94E1420 0006 | 94E1420-0013 | 94E1420 0014 | 94E1420-0015 |
| | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | | | | | | |
| Aluminum | 19000 | 20500 | 19800 | 23200 | 21600 | 17200 |
| Antimony | ND | ND | ND | ND | ND | ND |
| Arsenic | ND | ND | ND | ND | ND | ND |
| Barium | 81 8 | 92 1 | 68 1 | 79 9 | 81 8 | 56 6 |
| Beryllium | 0 84 | 1 0 | 0 89 | 1 1 | 1 4 | 1 0 |
| Cadmium | ND | ND | 0 35 | ND | ND | ND |
| Calcium | 1500 | 44800 | 45100 | 2390 | 4630 | 20100 |
| Chromium | 17 6 | 14 0 | 14 0 | 19 9 | 15 9 | 14 8 |
| Cobalt | 6 5 | 8 0 | 5 2 | 5 4 | 5 8 | 5 4 |
| Copper | 8 6 | 6 3 | 7 6 | 6 8 | 7 0 | 9 3 |
| Iron | 14900 | 11900 | 12700 | 14100 | 15700 | 14200 |
| Lead | 8 9 | ND | ND | 8 7 | 4 1 | 6 1 |
| Magnesium | 2110 | 2940 | 3450 | 2100 | 2620 | 2610 |
| Manganese | 129 | 117 | 127 | 257 | 265 | 192 |
| Nickle | 10 5 | 13 8 | 15 7 | 19 8 | 22 6 | 21 9 |
| Potassium | 2410 | 1740 | 1930 | 2000 | 1330 | 1400 |
| Selenium | ND | ND | ND | ND | ND | ND |
| Silver | ND | ND | ND | ND | ND | ND |
| Sodium | 8120 | 6800 | 7410 | 1020 | 583 | 194 |
| Thalium | ND | ND | ND | ND | ND | ND |
| Vanadium | 37 1 | 26 1 | 25 5 | 37 4 | 34 0 | 32 2 |
| Zinc | 35 4 | 25 4 | 25 8 | 28 4 | 24 0 | 22 2 |

## Table 3: Risks and Hazard Quotients

| HYPOTHETICAL RESIDENTIAL EXPOSURE TO SOIL | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Soil | | | | | |
| CARCINOGENIC | | | Concen | SFi | EF | IR | ED | BW |
| SOIL INHALATION | | | mg/kg | | | | | |
| | Risk | | | | | | | |
| CrVI | 3 70e-07 | | 3 47e+02 | 4 20e+01 | 350 | 20 | 30 | 70 |
| | | | | | | | | |
| | | | | | | | | |
| | | | Soil | | | | | |
| NONCARCINOGENIC | | | Concen | RfDo | EF | IR | ED | BW |
| SOIL INGESTION | | | mg/kg | | | | | |
| ADULT | HQ | | | | | | | |
| CrVI | 9 51e-02 | | 3 47e+02 | 5 00e-03 | 350 | 100 | 30 | 70 |
| CRIII | 4 75e-04 | | 3 47e+02 | 1 00e+00 | 350 | 100 | 30 | 70 |
| | | | | | | | | |
| CHILD | HQ | | | | | | | |
| CrVI | 8 87e-01 | | 3 47e+02 | 5 00e-03 | 350 | 200 | 6 | 15 |
| CRIII | 4 44e-03 | | 3 47e+02 | 1 00e+00 | 350 | 200 | 6 | 15 |
| | | | | | | | | |
| CONSTRUCTION WORKER EXPOSURE TO SOIL | | | | | | | | |
| | | | | | | | | |
| | | | Soil | | | | | |
| CARCINOGENIC | | | Concen | SFi | EF | IR | ED | BW |
| SOIL INHALATION | | | mg/kg | | | | | |
| | Risk | | | | | | | |
| CrVI | 5 28e-10 | | 3 47e+02 | 4 20e+01 | 30 | 10 | 1 | 70 |
| | | | | | | | | |
| | | | | | | | | |
| | | | Soil | | | | | |
| NONCARCINOGENIC | | | Concen | RfDo | EF | IR | ED | BW |
| SOIL INGESTION | | | mg/kg | | | | | |
| | HQ | | | | | | | |
| CrVI | 3 91e-02 | | 3 47e+02 | 5 00e-03 | 30 | 480 | 1 | 70 |
| CRIII | 1 96e-04 | | 3 47e+02 | 1 00e+00 | 30 | 480 | 1 | 70 |

**PAC REFERENCE NUMBER:** NE-1412 & NE-1413

IHSS Number: NA

Unit Name Trenches T-12 and T-13 Located in Operable Unit 2, East Trenches

CPIR No : NA

Approx. Location: N750,000; E2,087,000

Date(s) of Operation or Occurrence

The exact dates of operation for the east trenches are unknown, except for the time period of July 29, 1954, through August 14, 1968 Aerial photographs indicate that Trench T-12 was open between 1966 and 1967 but entirely covered by asphalt in 1968 when the east access road was built

Description of Operation or Occurrence

Trenches T-12 and T-13 were identified and incorporated into the Remedial Investigation (RI) for Operable Unit 2 (East Trenches) in June of 1993 when a plant employee completed further research of aerial photographs in the east trench area. Trench T-13 (PAC NE-1413) was visible only in vertical aerial photographs taken on April 15, 1966, and April 29, 1967 and is now covered by the East Access Road (north bypass) 900 feet east of the inner east guard gate. It is estimated to be nearly 250 feet in length and was filled with dark grey material as seen in the photograph. An employee was contacted who remembers that this trench may contain some laboratory wastes. Trench T-12 (PAC NE-1412) was identified as an extension of a previously identified trench (IHSS 111 8) during the same time period Both trenches lie primarily beneath the East Access Road. The trenches were used primarily for disposal of sanitary wastewater treatment plant sludge. The dried material removed from the sludge drying beds was typically placed in the disposal trenches. The total amount of sludge disposed of in the East Trench area is estimated to be 125,000 kilograms The trenches are documented as being approximately 10 feet deep with several feet of soil cover.

Physical/Chemical Description of Constituents Released

Some uranium and plutonium contamination is known to be present in the sludge. It is reported that the older sludge would have had primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination. Total long-lived alpha activity present in the sludge was reported between a minimum of 382 pCi/g in August of 1964 to a maximum of 3,591 pCi/g in June of 1960. Uranium contamination may also be present in flattened drums that may have been disposed of in any of the trenches following burning of the contaminated oils that had been held in the drum The flattened drums, estimated to be as many as 300 total, could be present in any of the trenches. It was estimated in a 1973 document that trench T-11 contains 16.2 grams of uranium-235. On at least one occasion it is believed that 2,400 gallons

of water and lathe coolant generated in Building 444 were also buried in one of the 12 trenches. This waste had an average activity of 150,000 dpm/l (presumed total alpha activity).

Response to Operation or Occurrence

Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigations (RFI/RI) are currently developing information which will detail the fate of constituents released from the newly identified trenches Further characterizations of these areas will proceed under the normal OU-2 schedule for the East Trenches. All validated analytical data will be documented in the OU-2 RFI/RI Report and transmitted to the Environmental Protection Agency (EPA) and the Colorado Department of Public Health & Environment (CDPH&E).

Fate of Constituents Released to Environment

The East Trenches are located in an area of a known groundwater contaminant plume No documentation was found which details the fate of the constituents disposed of in either Trench T-12 or T-13 Further characterization during the RFI/RI process will detail the fate of constituents released to the environment

Action/No-Action Recommendation

The two newly identified trenches warrant further investigation and are being actively characterized within the scope and schedule of Operable Unit 2

Comments

None

## SECTION 3.0

## REVISED PAC NARRATIVES
(No PAC Revisions)

# SECTION 4.0

# REVISED IHSS AND PAC MAPS